

Please amend the claims as follows. This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1-7. (canceled)

1 8. (currently amended) A composition comprising a nucleic acid, a polysaccharide or a saccharide, a lipid, an antibody or a non-biopolymeric small molecule covalently bound to a compound having the formula:  $R_1-X-R_2$ , wherein  $R_1$  is a cyclic ether group,  $R_2$  is an alkoxy silane group; and X is a moiety linking the cyclic ether group and the alkoxy silane group, wherein the composition covalently bound to the compound is soluble in aqueous solution.

2 9. (previously amended) The composition of claim 8, wherein the biological molecule comprises a nucleic acid.

3 10. (previously amended) The composition of claim 8, wherein the biological molecule comprises a polysaccharide or a saccharide.

4 11. (previously amended) The composition of claim 8, wherein the biological molecule comprises a lipid.

5 12. (previously amended) The composition of claim 8, wherein the biological molecule comprises a small molecule.

6 13. (previously amended) The composition of claim 8, wherein the cyclic ether group comprises an epoxide group.

7 14. (previously amended) The composition of claim 13, wherein the epoxide group comprises an ethylene oxide.

8 15. (previously amended) The composition of claim 8, wherein the alkoxy silane is selected from the group consisting of  $-Si(OCH_3)_3$ ,  $-Si(OC_2H_5)_3$ ,  $-Si(OCH_3)_3$ ,  $-Si(OCH_3)H_2$ ,  $-Si(OCH_3)(CH_3)_2$ , and  $-Si(OCH_3)_3CH_3$ .

9 16. (previously amended) The composition of claim 8, wherein the compound is 3-glycidoxypolytrimethoxysilane.

10 17. (currently amended) A modified biological molecule covalently bound to a compound having the formula:  $R_1-X-R_2$ , wherein  $R_1$  comprises an amino group,  $R_2$  comprises an alkoxy silane group ~~soluble in solution~~; and X comprises a moiety linking the amino group and the alkoxy silane group, wherein the modified biological molecule is soluble in aqueous solution.

11 ~~18~~. (previously added) The modified biological molecule of claim 17, wherein the biological molecule comprises a polypeptide or a peptide.

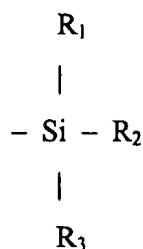
12 ~~19~~. (previously added) The modified biological molecule of claim 17, wherein the biological molecule comprises a polysaccharide or a saccharide.

13 ~~20~~. (previously added) The modified biological molecule of claim 17, wherein the biological molecule comprises a lipid.

14 ~~21~~. (previously added) The modified biological molecule of claim 17, wherein the biological molecule comprises a small molecule.

15 ~~22~~. (previously added) The modified biological molecule of claim 17, wherein the amino group is a primary amine.

16 ~~23~~. (previously amended) The modified biological molecule of claim 17, wherein the alkoxy silane is selected from the group consisting of  $-\text{Si}(\text{OCH}_3)_3$ ,  $-\text{Si}(\text{OC}_2\text{H}_5)_3$  and



wherein  $\text{R}_1$ ,  $\text{R}_2$  and  $\text{R}_3$  are selected from the group consisting of  $-\text{H}$ ,  $-\text{CH}_3$ ,  $-\text{OCH}_3$ , and  $-\text{OC}_2\text{H}_5$ , and at least one of  $\text{R}_1$ ,  $\text{R}_2$  or  $\text{R}_3$  is either  $-\text{OCH}_3$  or  $-\text{OC}_2\text{H}_5$ .

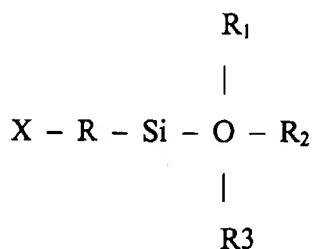
17 ~~24~~. (previously added) The modified biological molecule of claim 17, wherein the compound is 3-aminopropyltriethoxysilane.

18 ~~25~~. (previously amended) A microarray comprising:  
an underivatized solid support, and  
modified biological molecules covalently bound to a compound having the formula:  $\text{R}_1-\text{X}-\text{R}_2$ , wherein  $\text{R}_1$  comprises an amino group,  $\text{R}_2$  comprises an alkoxy silane group; and  $\text{X}$  comprises a moiety linking the amino group and the alkoxy silane group, immobilized onto the underivatized solid support.

22 ~~26~~. (previously amended) The microarray of claim <sup>18, 19, 20, 21</sup>~~25~~, ~~84~~, ~~85~~ or ~~86~~, wherein the solid support comprises hydroxyl groups.

23 ~~27~~. (previously amended) The microarray of claim <sup>18, 19, 20, 21</sup>~~25~~, ~~84~~, ~~85~~ or ~~86~~, wherein the solid support comprises glass.

- 24 28. (previously amended) The microarray of claim <sup>18, 19, 20, 21</sup>25, 84, 85 or 86, wherein the solid support comprises a surface selected from the group consisting of a quartz, a mica, an alumina, a titania, an SnO<sub>2</sub>, an RuO<sub>2</sub>, and a PtO<sub>2</sub>.
- 35 29. (previously amended) The microarray of claim <sup>18, 19, 20, 21</sup>25, 84, 85 or 86, wherein the solid support comprises a metal oxide surface.
- 26 30. (previously amended) The microarray of claim <sup>18, 19, 20, 21</sup>25, 84, 85 or 86, wherein the solid support comprises a compound selected from the group consisting of a polystyrene, a polyester, a polycarbonate, a polyethylene, a polypropylene, and a nylon.
- 27 31. (previously amended) The microarray of claim <sup>18, 19, 20, 21</sup>25, 84, 85 or 86, wherein biological molecules are immobilized onto the solid support in orderly, discrete spots.
- 36 32. (previously amended) The microarray of claim <sup>18</sup>25, wherein the discrete spots are about 50 microns in diameter.
- 29 33. (previously amended) A modified biological molecule, wherein the biological molecule is prepared by a process comprising the steps of:
- (a) providing a biological molecule comprising a guanine base or a cytosine base;
  - (b) reacting the guanine base or the cytosine base with N-bromosuccinimide at pH about 8.0 to form a brominated biological molecule; and
  - (c) reacting the brominated biological molecule with a silane having the formula –HN–(CH<sub>2</sub>)<sub>n</sub>–Si(OR)<sub>3</sub>, wherein n = 3, 4, 5, 6, 7, 8 or 9.
- 30 34. (previously added) The modified biological molecule of claim 33, wherein R is selected from the group consisting of –CH<sub>3</sub>, –C<sub>2</sub>H<sub>5</sub>, and –C<sub>3</sub>H<sub>7</sub>.
- 31 35. (previously added) A modified biological molecule, wherein the biological molecule is prepared by a process comprising the steps of:
- (a) providing a biological molecule;
  - (b) providing a compound having a formula



wherein X is a halide and R is a moiety linking the biological molecule with the Si moiety;

(c) reacting the biological molecule with the compound of step (b) at near neutral pH.

32-36. (previously added) The modified biological molecule of claim 35, wherein the halide is selected from the group consisting of a Cl, a Br, and an I.

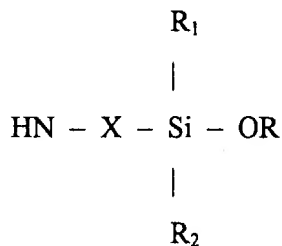
33-37. (previously added) The modified biological molecule of claim 35, wherein the R group is selected from the group consisting of a  $-\text{OCH}_3$ , and a  $-\text{OC}_2\text{H}_5$ .

34-38. (previously added) The modified biological molecule of claim 35, wherein the compound of step (b) is selected from the group consisting of 8-bromocyclotrichlorosilane, 8-bromocyclotromethoxysilane, 4-chlorobutylmethyldichlorosilane, and 3-iodopropyltrimethoxysilane.

35-39. (currently amended) A modified biological molecule covalently bound to a compound having the formula:  $-\text{HN}-(\text{CH}_2)_n-\text{Si}(\text{OR})_3$ , wherein  $n = 3, 4, 5, 6, 7, 8$  or  $9$ , wherein the modified biological molecule is soluble in aqueous solution.

36-40. (currently amended) The modified biological molecule of claim 39, wherein R is selected from the group consisting of  $-\text{CH}_3$ ,  $-\text{C}_2\text{H}_5$ , and  $-\text{C}_3\text{H}_7$ .

37-41. (currently amended) A modified biological molecule, wherein the biological molecule covalently bonded to a compound having the formula:

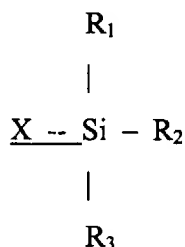


wherein R is selected from the group consisting of  $-\text{CH}_3$ ,  $-\text{C}_2\text{H}_5$ , and  $-\text{C}_3\text{H}_7$ , and  $\text{R}_1$  and  $\text{R}_2$  are the same or different and are selected from the group consisting of  $-\text{H}$ ,  $-\text{CH}_3$ ,  $-\text{C}_2\text{H}_5$ ,  $-\text{OCH}_3$ ,  $-\text{OC}_2\text{H}_5$ ,  $-\text{C}_3\text{H}_7$ , and  $-\text{OC}_3\text{H}_7$ ; and X is a linking group comprising an at least partially aliphatic chain, wherein the modified biological molecule is soluble in aqueous solution.

42-62. (canceled)

38 63. (currently amended) A modified biological molecule comprising a biological molecule covalently bound to a compound having the formula:  $R_1-X-R_2$ , wherein  $R_1$  comprises a cyclic ether, wherein  $R_2$  ~~is a  $NR_3$ ,  $R_3$  comprises a H or an alkyl group~~ comprises an alkoxy silane and X comprises a moiety linking the cyclic ether group and the alkoxy silane group.

39 64. (currently amended) A modified biological molecule comprising a biological molecule covalently bonded to a compound having the formula:



wherein  $R_1$ ,  $R_2$  and  $R_3$  are ~~the same or~~ different and are selected from the group consisting of  $-OCH_3$ ,  $-OC_2H_5$ ,  $-C_2H_7$ , and  $-Cl$ ; and X is a moiety linking the biological molecule to the compound.

65-77. (canceled)

40 78. (previously added) The composition of claim 8, wherein the nucleic acid comprises an RNA or a DNA.

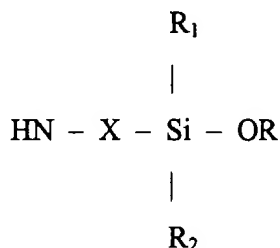
41 79. (previously added) The modified biological molecule of claim 17, wherein the biological molecule comprises a nucleic acid.

42 80. (previously added) The modified biological molecule of claim 79, wherein the nucleic acid comprises an RNA or a DNA.

43 81. (previously added) The modified biological molecule of claim 18, wherein the polypeptide is an antibody.

82. (canceled)

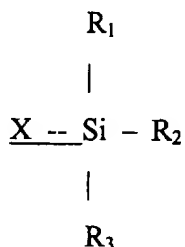
- 20 85. (previously amended) A microarray comprising:  
a solid support,  
a plurality of biological molecules covalently bonded to a compound having the formula:



wherein R is selected from the group consisting of  $-CH_3$ ,  $-C_2H_5$ , and  $-C_3H_7$ , and  $R_1$  and  $R_2$  are the same or different and are selected from the group consisting of  $-H$ ,  $-CH_3$ ,  $-C_2H_5$ ,  $-OCH_3$ ,  $-OC_2H_5$ ,  $-C_3H_7$ , and  $-OC_3H_7$ ; and X is a linking group comprising an at least partially aliphatic chain, immobilized onto the solid support, wherein the biological molecules covalently bonded to the compound are soluble in aqueous solution

- 21 86. (currently amended) A microarray comprising:  
a solid support, and  
a plurality of modified biological molecules covalently bound to a compound having the formula:  $-HN-(CH_2)_n-Si(OR)_3$ , wherein  $n = 3, 4, 5, 6, 7, 8, \text{ or } 9$ , wherein the modified biological molecules are soluble in aqueous solution.

83. (currently amended) A composition comprising a nucleic acid, a polysaccharide or a saccharide, a lipid, an antibody or a small molecule covalently bonded to a compound having the formula:



wherein  $R_1$ ,  $R_2$  and  $R_3$  are ~~the same or~~ different and are selected from the group consisting of  $-OCH_3$ ,  $-OC_2H_5$ ,  $-C_2H_7$ , and  $-Cl$ ; and  $X$  is a moiety linking the biological molecule to the compound.

- 19 84. (currently amended) A microarray comprising:  
a solid support, and  
modified biological molecules comprising a nucleic acid, a polysaccharide or a saccharide, a lipid, an antibody or a non-biopolymeric small molecule covalently bound to a compound having the formula:  $R_1-X-R_2$ , wherein  $R_1$  is a cyclic ether group,  $R_2$  is an alkoxysilane group; and  $X$  is a moiety linking the cyclic ether group and the alkoxysilane group, immobilized onto the solid support, wherein the modified biological molecules are soluble in aqueous solution.